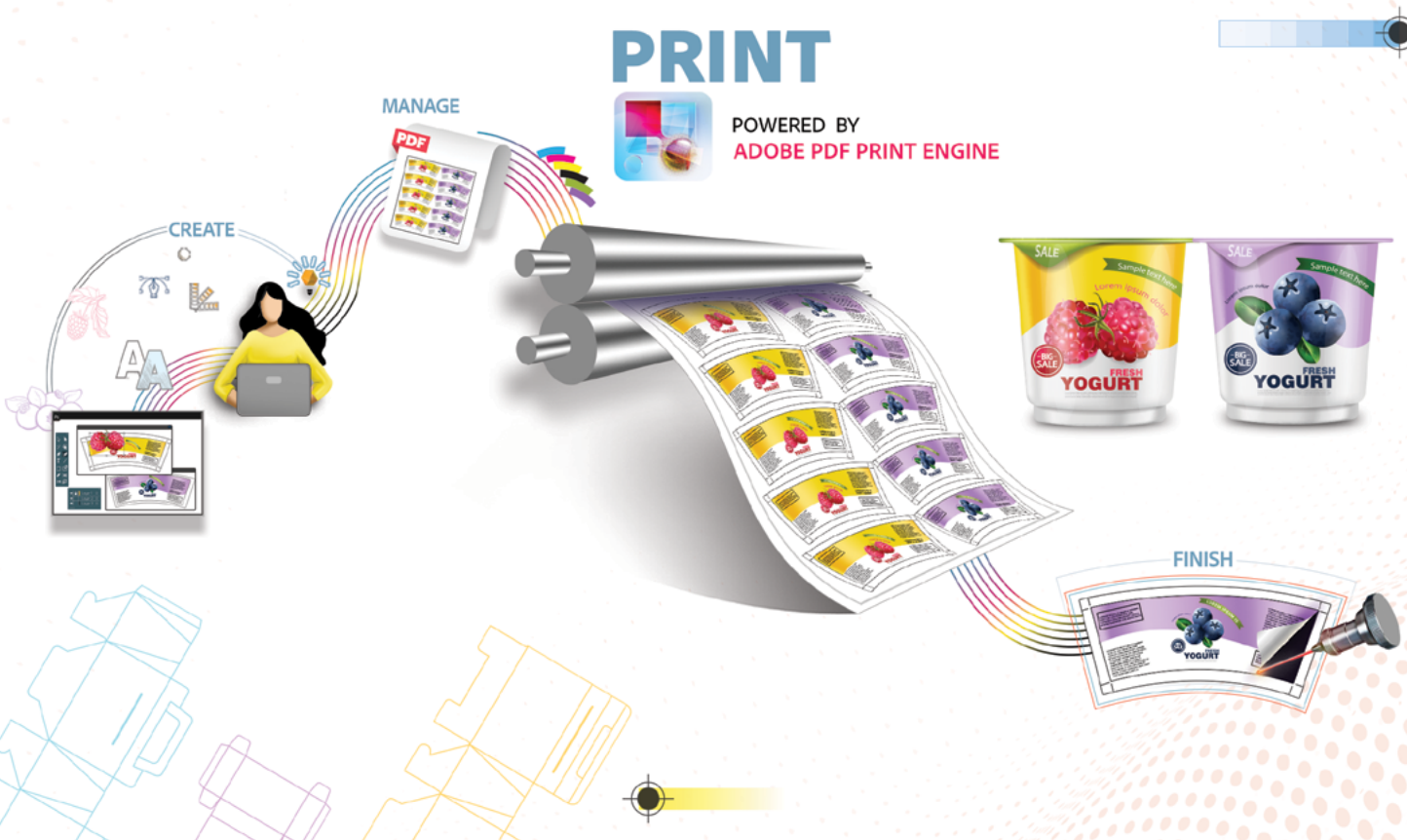
Digital Packaging Printing



Key Highlights:

- Get reliable results every time with the Adobe end-to-end workflow
- Adobe PDF Print Engine – Over 15 years of innovation from the Packaging Powerhouse
- Opportunities and challenges in packaging
- Bring the designer's vision to life
- Get it done with the Adobe PDF Packaging Experience
- Adobe PDF Print Engine – Perfect for Packaging

The next level in product packaging and labels printing

Adobe End-to-End Packaging Workflow – Reliable, Consistent, Predictable

Packaging is a highly specialized art form that balances visual appeal with exacting technical requirements. Effective packaging combines persuasive design, precision printing, and profitable converting. The result must convey the value of the product, encourage the consumer to buy, and reinforce brand value after the purchase.

From concept-to-product

For over 30 years, Adobe has been the software leader in the modern packaging industry, bringing game-changing innovations to brand owners, package designers, product marketers, prepress specialists, label manufacturers, print service providers, and converters. Brand owners value Adobe Creative Cloud applications such as Illustrator CC for designing the graphics on their Consumer Package Goods (CPG). Packaging converters recognize the value of Adobe prepress technology in their production workflows. Today, Adobe applications power every step in the packaging process, from design to review to final production. Uniquely in the packaging industry, Adobe's software portfolio spans the entire workflow, from concept to finished product. All components are based on the same set of core technologies, resulting in reliable, consistent, and predictable results at every stage.

Adobe PDF Print Engine

At the heart of the industry's leading packaging solutions is the PDF Print Engine. Packaging equipment vendors rely on PDF Print Engine to burn flexo, gravure and offset plates, and to directly stream rasters to high-speed inkjet presses (wide format and narrow format).
PDF Print Engine is key to the Adobe PDF Packaging Experience – unleashing the power of Adobe PDF to achieve the highest quality standards in graphic reproduction, and the most effective collaborative workflows for every type of packaging job.

Adobe PDF Print Engine – Over 15 years of innovation from the Packaging Powerhouse

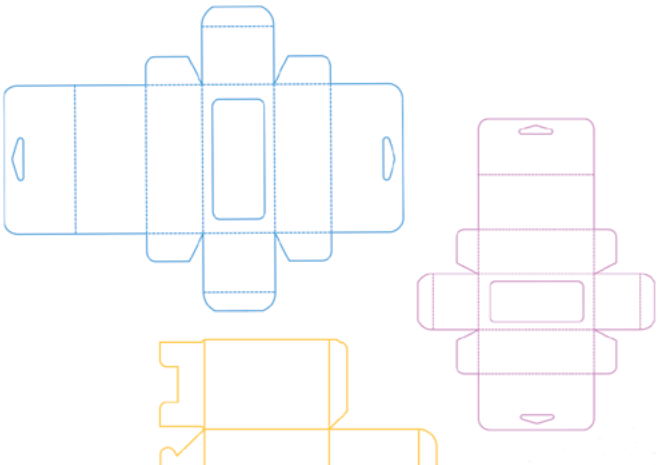
Adobe PDF Print Engine is the rendering engine built into the market's leading prepress products. Its core mission is to convert the graphical shapes, text, and images in the package PDF job file into pixels. The result is a dense grid of rasters, one for each ink, where the grid spacing matches the resolution of the platesetter or digital press. Since its introduction in 2006, the Adobe Print Family has worked closely with our partners to bring the latest advances in imaging science to packaging workflows. Ongoing innovation in plates, inks and press hardware continues to transform the CPG production landscape. These developments have enormous potential to improve color reproduction, lower material costs, accelerate throughput, apply eye-catching special effects, and print better graphics on every package substrate, including labels. PDF Print Engine is key to capitalizing on the potential of new materials, prepress techniques, and capabilities of the latest packaging presses. In short, Adobe PDF Print Engine is perfect for packaging.

Packaging challenges & opportunities

Of all the mass production machinery in the world, the printing press has the longest history. The industry has continually changed over the last 500 years. Today, technical innovation continues its forward march, enriching press capabilities, improving visual quality, and increasing manufacturing efficiency. The challenge is for brand owners, equipment manufacturers and converters to capitalize on the new technologies, advance the graphic arts, and drive the industry forward. A number of trends are particularly relevant to packaging and labels.

Advances in color & ink management

Corporate and product colors are a key brand asset, which must be carefully managed to achieve a consistent appearance when printed on different substrates. Spot color inks augment process inks to visually convey product attributes. But, Extended Color Gamut printing (ECG) is finally getting some traction, after 25 years of false starts. This can be attributed to the rapidly growing adoption of inkjet presses for package and label printing. For most digital presses, dedicated spot color inks are generally unavailable or prohibitively expensive. Fortunately, virtually all corporate colors can be produced with traditional process inks (Cyan, Magenta, Yellow, Black), plus additional inks such as Orange, Green, Blue. Flexo, gravure, and offset presses have offered additional inkstations for many years, and new digital presses with more inkstations are hitting the market. More recently, more printers and brand owners are relying on spectrally defined spot colors, which are independent of a light source. Spectral spot colors have the potential to yield more precise results than physical swatches or named colors.

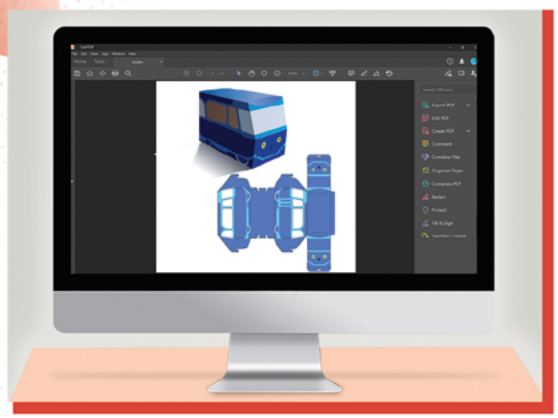


Compliance & accountability

Government regulations and consumer demand are driving greater accountability in packaged goods. Today packages often sport unique track-and-trace numbers or barcodes, backed up by online reporting platforms and blockchain distributed ledgers. These enable product stakeholders (e.g. distributors, retailers, and sometimes even consumers), to obtain data on the origins and chain of custody for each product. Unique identity information can also be imprinted on each package for authentication purposes.

Press registration

Packages are printed using several different press technologies, including flexographic plates, rotogravure cylinders, offset lithography and digital inkjet. Many packages are made of non-standard papers and other materials, including flexible plastic, fixed plastic, glass, cardboard and metal. Materials can be sheet-fed, or continuous roll-fed. The printing condition for a packaging job combines these factors (press technology, substrate), plus several others, including: ink viscosity, ink coverage, press speed, and screening. Many of these conditions are prone to misregistration between plates (or planes in the case of a digital press). This can result in misaligned text and graphics, or other visible artifacts.

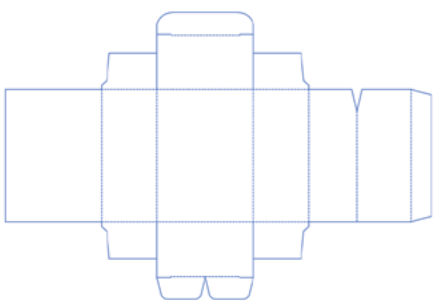


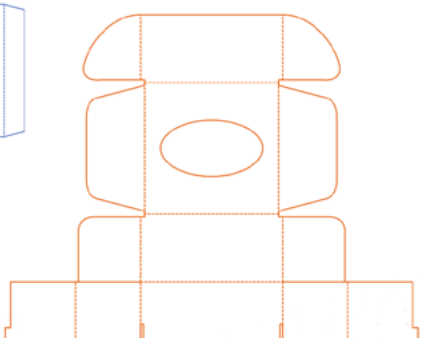
Assuring print quality

Package and label graphics must be flawless, since the package is a reflection of its contents. So packaging jobs are closely inspected at every stage, more than any other job type in the print industry. The last possible point in the prepress workflow to obtain a clear picture of the appearance of the printed job, before actually printing it (or producing plates), falls after rasterization (conversion to pixels).

Text rendering

The limited real estate on most packages is a major constraint on the content design. Compounding this limitation, government regulations generally specify a baseline of mandatory content, e.g. ingredient panels, trademarks, disclaimers, etc. The net result is that text is often printed using a very small point size and/or condensed typefaces. Furthermore, some packaging workflows require that text elements be converted to filled outlines (graphics), to reduce the opportunity for inadvertent errors, and limit printer liability. But locking down the text reduces prepress flexibility, e.g. the ability to make legitimate changes.



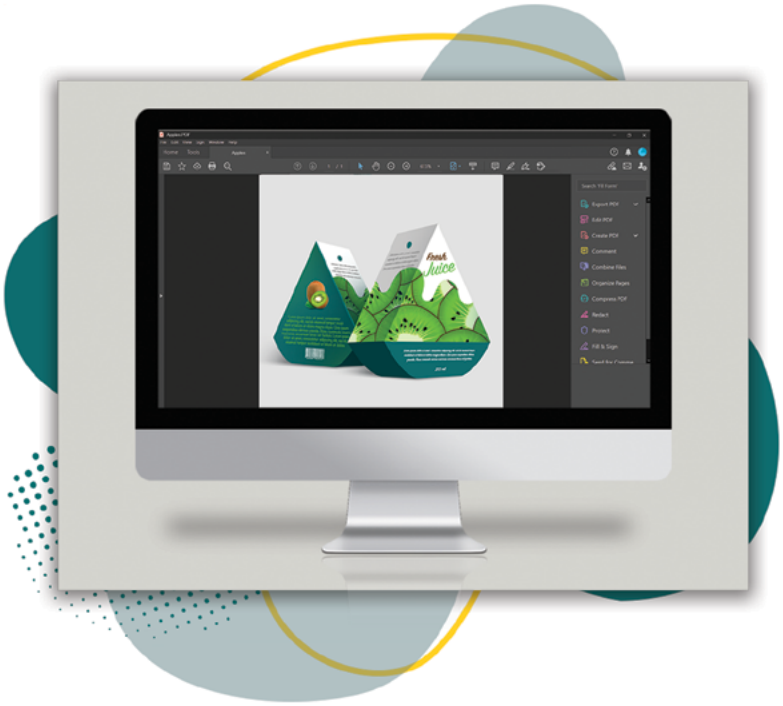


It starts with an idea

Packaging professionals equate the Adobe brand with creative excellence. Adobe applications give all project stakeholders the confidence to successfully execute every type of packaging job.

Hundreds of thousands of package designers rely on Adobe Illustrator CC and Photoshop CC to push the creative envelope, enriching product messages with the latest graphic effects. Sophisticated professional tools seamlessly manage complex elements, freeing the designer to explore fresh visual concepts to express product themes, and capture the mind-share of overloaded consumers.

Bringing a package from initial concept to manufacturing production is a complex process, requiring ongoing collaboration among all stakeholders: review, approve, revise . . . repeat. Packaging requires more reviews, approvals, and revisions than any other graphic art job type. Adobe-quality PDF files can be shared and managed by Adobe Acrobat DC. Acrobat captures and conveys the design for review, approval, proofing, and printing.



Adobe PDF for Packaging

Adobe invented the Portable Document Format over 25 years ago. With its robust and reliable imaging model, Adobe PDF was quickly adopted by package designers to convey approved content to their prepress service. Packaging is the face of the product contained within, so the quality of the graphic content and print reproduction are paramount. With tight space constraints, and stringent regulatory compliance rules, package designs are both dense and complex. Package jobs also pose printing challenges, since they use special colors, non-standard substrates, special effects, intricate finishing and variable data. Prepress operators welcome packaging jobs submitted as PDF files, and prefer to work with PDF throughout the prepress cycle, since PDF preserves job content at the highest level of abstraction, maximizing workflow flexibility while limiting possible errors that could be introduced during job processing and modification steps.

Adobe literally wrote the book on PDF. However, in 2008 Adobe gave the PDF file specification to the International Standards Organization (ISO). Today, industry associations such as the Ghent PDF Workgroup recommend PDF and PDF/X for exchanging packaging and label jobs. When stakeholders of a packaging job use the right Adobe product for each function, everyone benefits from the Adobe PDF Packaging Experience. The advantages derived from using the same core Adobe PDF libraries at every stage of the workflow. These Adobe-patented algorithms and interfaces operate “under the hood” of Adobe’s Creative Cloud graphic arts programs, Acrobat DC and the Adobe PDF Print Engine. They handle operations such as: color management, transparency flattening, font handling, text rendering, layout parsing, image manipulation, and print generation (interpretation, rasterization, screening).

Get it done with the Adobe PDF Packaging Experience

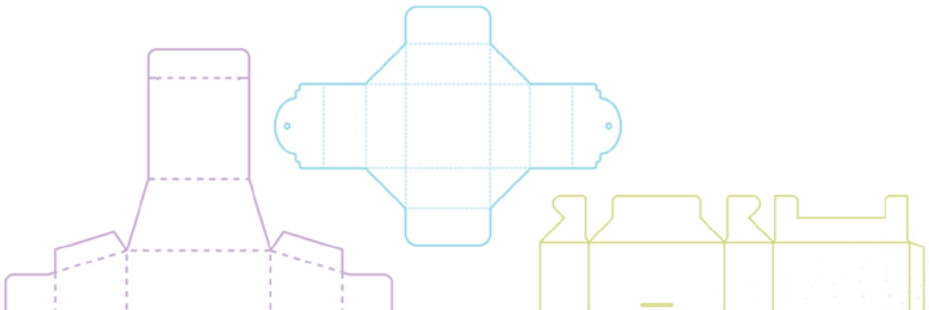
The Adobe PDF Packaging Experience yields maximum print quality for packaging designs. It delights CPG product owners and marketers. For workflow participants, it delivers reliability, predictability, and consistency, thus streamlining production, minimizing errors, and reducing costs. The Adobe PDF Packaging Experience results from harnessing the power of Adobe PDF as the "single source of truth" for every aspect of the job, from concept to finished product: is based on 4 fundamental concepts:

Create

When a job is ready to be shared with stakeholders, the packaging designer freezes content by exporting it from Photoshop CC, Illustrator CC, or InDesign CC as a PDF file. Job components are constructed using Adobe's proprietary algorithms, resulting in a compact, Adobe-quality PDF file.

Manage

The recipient opens it in Acrobat DC, where job elements are accurately displayed on-screen, including spot color channels, images, text elements, transparent and overprinted objects. Acrobat DC is the gold standard for previewing and checking jobs on-screen. It includes an online review service for managing feedback from brand owners and marketers.



Print

The goal of prepress is to prepare the job for a real-world "printing condition". When the package or label design is finalized, the Adobe-generated PDF file is submitted to print production. Prepress operators use the professional print production tools in Acrobat DC to preflight, preview output + flattened transparency, convert colors and manage inks. Sometimes elements are inspected and tweaked to ensure optimal reproduction on press. Acrobat can also be used for minor edits, such as last-minute customer changes. The PDF file will be rendered by the Adobe PDF Print Engine, the cornerstone of the packaging prepress system. Color channels are separated, pages are imposed into signatures, trapping parameters are set.

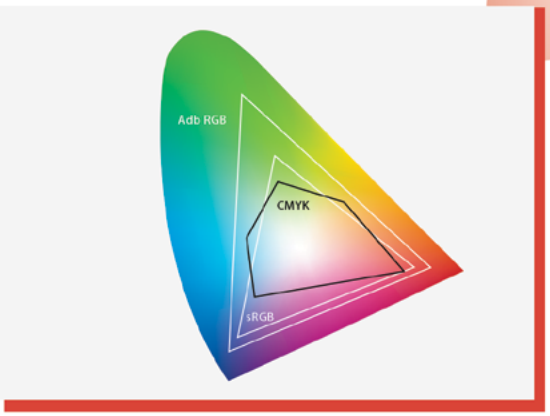
Finish

The complex form of many packages require post-press conversion, including cutting, folding, gluing, and perforation. These job elements, which may originate in CAD applications, can be imported into Adobe Illustrator CC on dedicated layers, or as pre-defined spot colors. When exported to Adobe PDF, they become an integral part of the job. This holistic approach provides all job stakeholders a complete view, combining the graphics and manufacturing elements in perfect alignment. Similarly, packages often feature special effects such as varnishes, foils, and metallics which are applied post-press. Adobe PDF enforces synchronization between graphics, special effects and manufacturing. The PDF Print Engine ensures that any late-stage production transforms (e.g. scaling, positioning, rotation) are uniformly applied to all elements: rendering the graphics, then conveying the synchronized special effects, and manufacturing instructions to dieline software and/or finishing equipment.

Adobe PDF Print Engine – Perfect for Packaging

Prepress solutions built on the Adobe PDF Print Engine dominate global printing, delivering state-of-the-art rendering to the world's top CPG brands. Adobe is unrivaled in the field of printing software, with more than 35 years of accumulated expertise, hundreds of patents, and deep institutional knowledge of imaging and color science. Excellence in packaging has been central to the PDF Print Engine since version 1.0. Today the Print Engine features a comprehensive set of capabilities geared for this dynamic industry segment.

Color management for spot colors



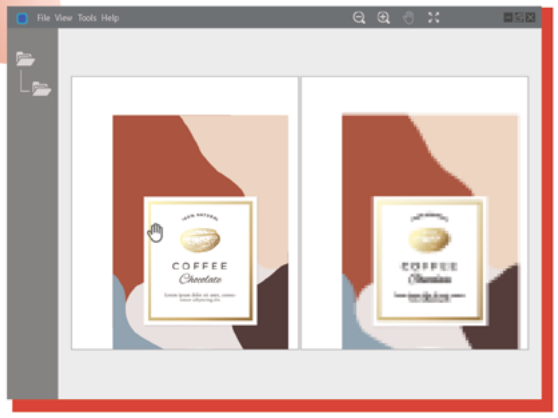
PDF Print Engine accurately emulates spot colors on proofing devices and the latest Extended Color Gamut presses (ECG). Strong color reliability eliminates unwelcome surprises on-press, and better predictability increases brand owner trust at every step of the process. PDF Print Engine includes the industry's most sophisticated algorithms for mixing spot color inks, and blending transparency stacks that include spot and process colors. For spot colors defined with spectral values, the Print Engine can extract CxF data, to be used for conversion and ICC-based color management.

Variable Data Print (VDP) for tracking, tracing, and authentication

Adobe pioneered the development of PDF/VT (Variable, Transactional), the first VDP file format to fully harness the power of the PDF imaging model. In 2010, PDF/VT became an international standard (ISO 16612). That same year, Adobe announced PDF/VT support in PDF Print Engine 2.5, the first rendering technology to do so. Digital presses or dedicated inkjet stations are required to print variable content. The main challenge is not the unique variable elements, but caching the common repeating elements to avoid redundant processing, maximize performance, and drive the fastest digital presses at their rated speeds. Adobe PDF Print Engine has established a strong track record as the leading rendering technology for inkjet package and label printing, including VDP.

Trapping module

Anticipating the possibility of misregistration between plates or color planes, prepress operators in packaging workflows often choke or spread the adjacent edges of different colors to prevent gaps between colors, or colors that stick out beyond their intended boundary. These issues are sometimes handled on a case-by-case basis, requiring manual intervention by a knowledgeable specialist. But, it is much more efficient to automate this function. The PDF Print Engine includes a dedicated, high performance trapping module to automatically trap packaging jobs during rendering. Over the last 15 years, the Print Engine trapping module has proven itself in tens of thousands of packaging prepress operations around the globe.

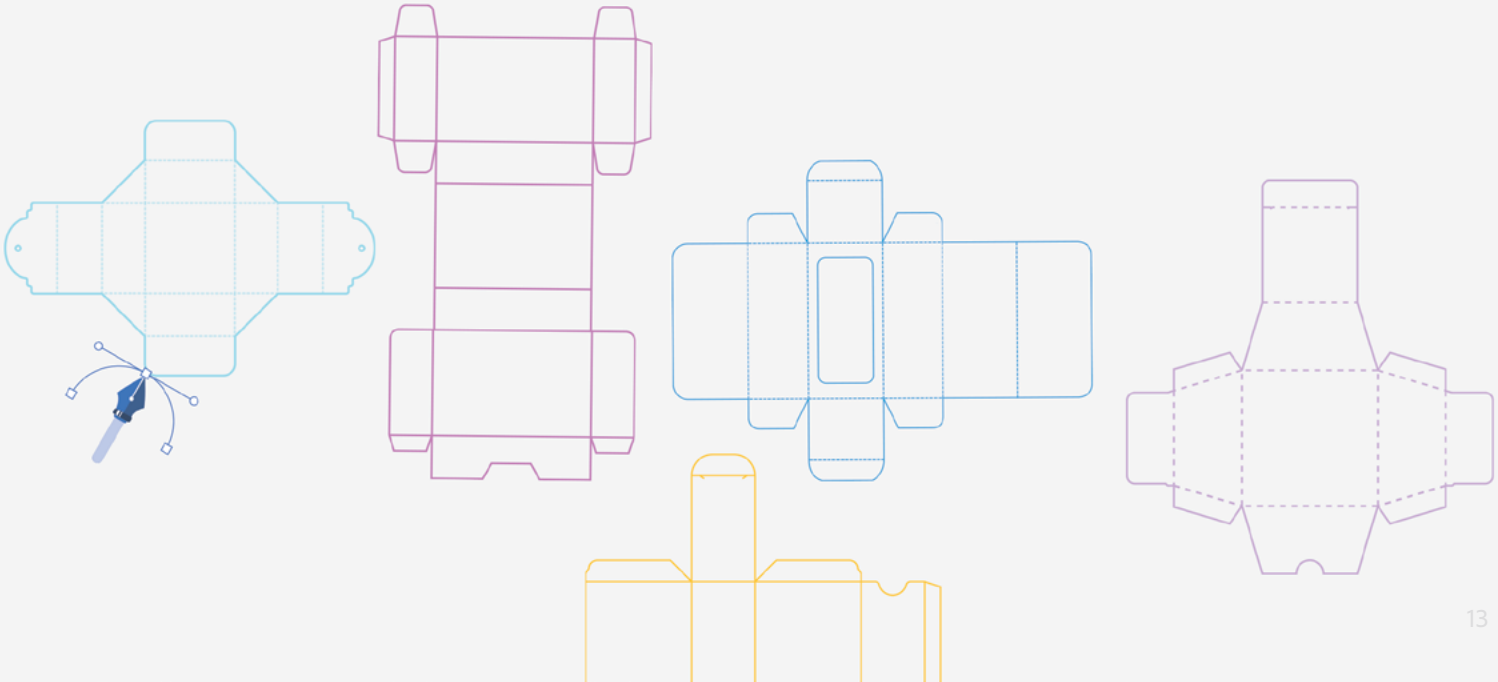


Raster preview

The bit-map generated by the PDF Print Engine is accessible to the Digital Front End (DFE) or prepress solution. Prepress operators can use this to verify a job on-screen, sometimes right down to the pixel level. This is a final check before committing the job to full-scale production. PDF Print Engine also includes technologies which can facilitate real-time rasterization of a specific job region, for example an area of interest which makes up only a small subset of the complete surface. This enables rapid interactive zoom and pan navigation around the job surface.

CoolType & Fine Line Rendering

The PDF Print Engine includes Adobe CoolType technology, the same technology used in Adobe interactive software, which excels at reproduction of all text sizes. CoolType is able to anti-alias hard edges with semi-transparent pixels that take advantage of multiple color levels, if available, thereby improving the visual smoothness of font characters (a.k.a. “glyphs”). But some packaging workflows require that text elements be converted to filled outlines, to reduce the opportunity for inadvertent errors, and therefore printer liability. In these cases, the usual CoolType algorithms do not apply, since the text has effectively become graphics. For some small point size text, with fine details, the non-printed areas of the characters may fill in with ink. To resolve this issue, Adobe PDF Print Engine 5.5 added an ingenious new feature called “Fine Line Rendering.” This option can apply a lighter touch when rendering graphics, thus enhancing the appearance of small, outlined text elements.



Get started

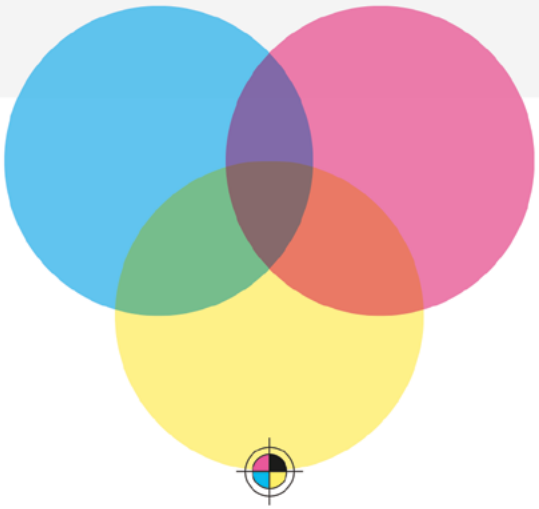
For more information on how Adobe is powering digital packaging printing workflows,

Contact us at: packagingprint@adobe.com

Or visit: http://adobe.com/go/PackagePrint

Learn more about Adobe PDF Print Engine,

http://adobe.com/go/PDFPrintEngine



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